Nuffield College. *Training for Social Work.* 1946. Pp. 63.

Raymond, E. (Editor). *The Autobiography of David ——.* 1946. Pp. 168.

Registrar General's Statistical Review of England and Wales for the Year 1941. Tables, Pt. 2, Civil. 1946. Pp. 92.

Reich, W. *The Function of the Orgasm.* 1942. Pp. 368.

Roe, A., Burks, B., and Mittelmann, B. *Adult Adjustment of Foster Children of Alcoholic and Psychotic Parentage and the Influence of the Foster Home.* 1945. Pp. 164. Presented by Dr. Eliot Slater.

Schlaginhaufen, O. *Anthropologia Helvetica.* I. *Die Anthropologie der Eidgenossenschaft.* 2 vols. 1946. Pp. 699, 161 maps and 168 plates.

Symonds, P. M. *Diagnosing Personality and Conduct.* 1931. Pp. 602.

Thompson, W. S. *Population and Peace in the Pacific.* 1946. Pp. 397.

Elections to the Society

THE following have been elected Members of the *Society* during the past quarter:

J. A. Carter, Esq.
M. S. Holman, Esq., M.B., M.R.C.S.
Alexander Kennedy, Esq., M.D., M.R.C.P., M.R.C.S.
Mrs. Arthur Long.
David A. Peat, Esq.
Richard Rumbold, Esq.

REVIEWS OF BOOKS

PSYCHOLOGY

Thomson, Godfrey. *Factorial Analysis of Human Ability* (2nd edition, revised and enlarged). London, 1946. University of London Press, Ltd. Pp. 386. Price 16s.

PROFESSOR THOMSON'S book has already become a standard exposition of the mathematical techniques of factor-analysis. The fact that the first edition was exhausted so rapidly is a testimony to the increasing interest now being taken in the application of novel statistical procedures to the problems of the mind. In the new edition, as the author points out, the most important of the many changes is the expansion of what originally was a single chapter "into three chapters, on Orthogonal Simple Structure, Oblique Factors, and Second Order Factors." These technical terms will at once convey to the initiated that Professor Thomson's chief object has been to include a fuller and more up-to-date account of Professor Thurstone's recent contributions to the subject.

Comparatively little is said about recent work in this country. But this after all has been concerned not so much with the discussion of methods as with the attainment of results. Moreover, summaries of British investigations, and of concrete conclusions so far reached, are already accessible; whereas Thurstone's contributions are for the most part to be found chiefly in American periodicals, which are highly technical and as yet not easily obtainable even in academic libraries. Pending a new book by Thurstone himself, some such account as Thomson gives us is urgently needed, and the exposition is marked by all his lucidity and comprehensive grasp.

It might, I think, be fairly claimed that modern factor-psychology is a natural development of Galton's early teaching. "Galton's idea of general intelligence," as Professor Pintner has pointed out, "has not only had a great influence on psychological thought, but is very like the psychological conception at the present time." Rejecting the current view of discrete levels or types (imbeciles, dullards, normals and defectives), he proposed to treat "natural

ability" as a continuously varying factor, entering into and determining a wide range of intellectual activities, and capable of indirect measurement. But in addition he also assumed the existence of a number of more specialized abilities, manifested only in limited groups of activities—group-factors, as they would now be called. To him, too, we owe the notion of constructing psychological tests to assess these various abilities and of estimating the value and nature of the tests themselves by statistical calculation. Above all, the fundamental tool of the factorist—the coefficient of correlation, as a device for measuring the degree of joint variation produced by a common factor—was Galton's special contribution.

The reader of this REVIEW, a little bewildered perhaps by subsequent controversies between the different schools of "correlational psychology," will want more particularly to know how far current factor-analysis bears out the underlying assumptions made by Galton, and in what direction Professor Thomson's own investigations appear to be tending. The earliest theories advanced by the psychological factorist sought first of all to simplify the double hypothesis, which eugenic writers (amongst others) took over from Galton. Need we assume the existence *both* of a general factor *and* of a multiplicity of group factors? In a summary of the earliest efforts to apply correlation methods to the results of psychological tests (EUGENICS REVIEW, 1912, pp. 1-33) I myself assumed that a number of inheritable mental factors were bound to be postulated, special as well as general. In a later contribution on "The Heredity of Abilities," Spearman argued that "the future of research into the inheritance of ability must centre on the theory of two factors"—a far simpler assumption. And in the present volume Thomson opens his discussion by an examination of this attractive theory, since that sets out the factorial hypothesis in its simplest possible form. Spearman's theory maintained the supremacy of a single central factor (g), and denied, or at any rate doubted, the need for a number of "basic faculties" as well. Thomson, on the other hand, showed that correlatiou tables, like those adduced by Spearman, could be explained by group factors only, without invoking any general factor.

Twenty years later, when Thurstone entered the field, he too seemed highly sceptical about the need for anything besides group factors. "So far," he wrote, "we have not found the general factor of Spearman." Admittedly the preliminary analysis, which he makes with the aid of the simple formula used by many workers in this country, does yield a statistical factor, which is "general" in Spearman's sense. But by "rotating" the results so obtained, Thurstone is able to explain the empirical correlations in terms of a "simple structure" of group factors only. And if, as he proposes in his later work, we are willing to accept structures that consist, not necessarily of "orthogonal" (or uncorrelated) factors, but also of "oblique" (or correlated) factors, then we can, it would appear, always dispense with a general factor. And thus, as Professor Thomson puts it, "Spearman's g" seems to have been "apparently abolished." However, as he goes on to observe, the critics are now apt to complain that "when obliquity is permitted, simple structure is all too easily reached to prove anything."

But more recently still Thurstone has suggested that, just as we factorized the correlated tests, so we may go on to factorize the correlated factors. This yields what he terms "second-order factors"; and we then discover "a hidden general factor causing the obliquity." Thus, in Thomson's words, "we see here a distinct step towards a reconciliation between the two analyses" of the conflicting schools. The onlooker will be tempted to add that the old method of analysing a correlation table into a single general factor and a number of group factors gave much the same result at a single step. And so we seem at length to be returning to the broad hypothesis, assumed by Galton and favoured all along by most educational psychologists, that the constitution of the mind includes *both* a general ability ***and*** a number of more specialized aptitudes.

The eugenist will naturally inquire how far it is safe to identify the abstract factors of the statistical psychologist with the inheritable factors that interest the genetic psychologist. Here Thomson quite rightly warns us to go carefully. "What the factorist calls the verbal factor, for example, is something very different from what the world recognizes as verbal ability." And in his earlier writings he appeared to regard the general factor, not as in any sense identifiable with an inheritable quality of the mind or central nervous system, but rather as a statistical artefact: he was "not personally a believer in the existence of a faculty called general ability." But in the present volume he seems ready to accept the idea of such a factor, provided it is interpreted as "an index of the span of the whole mind," or, as he has very acutely expressed it elsewhere, as "a sort of *volume* of the mind which does not give any indication of its *shape*." Moreover, in a sentence added in the new edition, he admits that the divergence between the two interpretations is not so wide as formerly appeared.

We can therefore discern a progressive convergence of views as time goes on, which is certainly encouraging for those who recall the old disputes and controversies. Let me repeat, however, that Professor Thomson's main task is not to give a picture of the constitution or structure of the human mind, but rather to describe and evaluate the mathematical tools devised for analyzing that structure. And this he has done with admirable clearness and completeness.

In his Presidential Address, delivered to the British Psychological Society last year, and now issued by them in pamphlet form,* Professor Thomson covers much the same new ground in less technical form. Here his purpose, he explains, is twofold. He first gives an interesting account of Thurstone's new methods, and then proceeds to a short survey of the development of the whole subject from the time of the early controversies with Spearman onwards. He ends with a final tribute to Spearman, whose death deprived British psychology of one of its foremost figures. The whole makes an admirable introduction for the general student.

CYRIL BURT.

**Some Recent Work in Factorial Analysis and a Retrospect*, University of London Press Ltd., 1946, pp. 16.*

CRIMINOLOGY

Radzinowicz, L., and **Turner, J. W. C.** (Editors). *Penal Reform in England.* By S. K. Ruck *et alia*; foreword by the Right Hon. the Viscount Caldecote; preface by Professor P. H. Winfield. English Studies in Criminal Science, Vol. 1. 2nd Edition. London, 1946. Macmillan. Pp. x + 192. Price 12s. 6d.

THE first edition of this book appeared in 1940, and introduced the series of English Studies in Criminal Science inaugurated by the Faculty of Law, Cambridge University. Its purpose was to present an authoritative and concise summary of the administration of criminal justice in England. The present edition represents the collaboration of twelve experts under a definite scheme and has been brought up to date, revised and enlarged.

S. K. Ruck writes on "Developments in Crime and Punishment" and introduces statistical matter which will be of assistance in obtaining a well-balanced approach to the subject. In his summary this writer considers that some courts fail to use instructedly some modern methods, and emphasizes his point by referring to the unsuitability of some offenders who are placed on probation. C. M. Craven deals with the "Trend of Criminal Legislation" concisely and critically. A. Lieck contributes a masterly essay on "The Administration of Criminal Justice," fully documented, and written so lucidly that the inquiring layman will often turn to it for instruction. Sir John Maxwell, a new contributor, discusses "The General Development and Outstanding Features of the English Police System" in an essay which is largely historical and full of interest. He considers that whatever changes are suggested in our existing police system, as a result of post-war recon-